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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/536,656	08/15/2005	Wolfgang Issler	ISSLER - 7PCT	9079

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EXAMINER
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CHEN, BRET P

ART UNIT	PAPER NUMBER
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1762

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/25/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/536,656

Applicant(s)

ISSLER, WOLFGANG

Examiner

B. Chen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 May 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____.  | 6) <input type="checkbox"/> Other: ____.                          |

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### **DETAILED ACTION**

Claims 1-9 are pending in this application, which is a 371 of PCT/DE03/03930.

#### ***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

#### ***Drawings***

Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

It is not clear whether Figure 1 should be labeled prior art as recited by the applicant. Appropriate amendments are requested.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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**Claims 1-9 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement.** The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

In claim 1 step b), the phrase “applying a pre-stress” is confusing as the specification does not enable one skilled in the art how to apply a pre-stress. It should be noted that the specification does not provide any guidance as to how this step is carried out. The same issue applies to a “tensile pre-stress” and a “pressure pre-stress” and in claims 2, 4.

In claim 1 step a), the term “adjusting the coating parameters” is deemed non-enabling as the specification does not provide any guidance as to how the coating parameters should be adjusted. For example, if the skilled artisan were to adjust temperature, should it be increased or decreased?

In claim 1 step e), the term “applying a tensile pre-stress or pressure pre-stress to a ... piston ring, as a function of the measured inherent coating stress” is deemed non non-enabling as the specification does not provide any guidance as to how the pre-stress should be applied. For example, if the skilled artisan were to measures an inherent coating stress of A, how would the skilled artisan apply the pre-stress?

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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**Claims 1-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

In claim 1, the phrase “consisting of steel or cast iron” appears to be modifying the internal combustion engines. It is the examiner’s position that it is supposed to be modifying the piston rings and will be treated as such in this office action. Clarification and appropriate amendments are requested.

In claim 1, the phrase “comprising the characteristics” is confusing as to whether it is modifying the coating process in line 5 or the method in line 1. Furthermore, is the method different from the process? It is the examiner’s position that the coating process and the method should be the same and should be described in full. Still further, the term “characteristics” is vague and indefinite and should be replaced with the term --steps--.

In claim 1 step a), the term “the coating parameters” lacks antecedent basis. What coating parameters is being referred to?

In claim 1 step b), the term “predetermined piston ring diameter” is deemed vague and indefinite as to what said term means. How does one skilled in the art determine what is the predetermined diameter?

In claim 1 step b), the term “total free gap” is deemed vague and indefinite as to what said term means and/or what it is referring to.

In claim 1 step c), the term “the ion coating process” lacks antecedent basis.

In claim 1 step d), the term “the inherent coating stress of the anti-abrasion or anti-corrosion coating in status b)” lacks antecedent basis as there is no anti-abrasion or anti-

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corrosion coating in step b). Furthermore, it is not clear what “status b)” is referring to. The examiner will assume that it is referring to step b). Appropriate amendments are requested.

In claim 1 step e), the terms “a tensile pre-stress” and “pressure pre-stress” is deemed confusing as to what the difference is between the two. Furthermore, how is this application step different from that of step b)? Clarification and if necessary, appropriate amendments are requested. The same issue applies to claim 2.

In claim 1 step e), the phrase “a new, uncoated piston ring” is deemed vague and indefinite as to whether it is different from the piston ring in lines 1-2. If it is the same, the examiner suggests deleting the word “new”.

In claim 2 lines 4-5, the term “the ring circumference” lacks antecedent basis.

In claim 2 lines 6-7, the term “the anti-abrasion and anti-corrosion coating” lacks antecedent basis.

In claim 2 line 8, the term “the circumference” lacks antecedent basis. Furthermore, is this circumference different from that recited in lines 4-5?

In claim 3 lines 2-3, the term “the anti-abrasion and anti-corrosion coating” lacks antecedent basis.

In claim 3 lines 4-5, the term “the installed state” is deemed vague and indefinite as to what said term means.

In claim 4 lines 2-4, the phrase “application of the tensile or pressure pre-stress to the piston ring takes place over the entire duration of the coating process” is deemed vague and confusing as independent claim 1, from which claim 4 depends from, does not require that these

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steps are performed simultaneously. In addition, it is not clear which coating process is being referred to. The same issue applies to claims 8-9.

In claim 6 line 3, the term "the ring joint" lacks antecedent basis.

It is noted that the applicant's claims as presently written are extremely confusing as to the order of the steps. For example, how does one adjust the coating parameters when no coating parameters are listed? How does one measure the inherent coating stress of a coating, when the coating hasn't occurred? Applicant is invited to amend the claims to clarify what the applicant's invention is.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazaki et al. (5,449,547) in view of Dworak et al. (4,535,683) and vice versa.** Miyazaki discloses a method of applying a hard film 2 having toughness and slideability characteristics to cover an

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outer circumferential surface of a piston ring 1 by an ion plating process (col.1 lines 9-13) The hard film can be CrN having 3 percent to 20 percent by weight of oxygen, or 2 percent to 11 percent by weight of carbon and has a Vickers hardness in the range of 1600 to 2200 (col.1 lines 35-45). X-ray diffraction was utilized to measure the properties of the film (col.4 lines 20-33). However, the reference fails to teach applying a pre-stress.

Dworak discloses a method of applying a prestress during coating of a piston (col.2 lines 26-44) to prevent thermally induced stress (col.1 lines 51-60). It would have been obvious to utilize Dworak's prestress step in Miyazaki's process with the expectation of preventing thermally induced stress. Furthermore, it would have been obvious to utilize the ion plating process of Miyazaki's in Dworak's process with the expectation of obtaining better toughness and slideability characteristics.

The limitations of claims 2-9 have been addressed above.

Keem et al. (4,619,865) teaches of applying a bias to reduce stress. Hamada et al. (6,886,521) teaches of utilizing multilayers to reduce stress. Massier et al. (7,160,616) teaches of varying composition to reduce stress. All have been cited as relevant art.



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Any inquiry concerning this communication or earlier communications from the examiner should be directed to B. Chen whose telephone number is (571) 272-1417. The examiner can normally be reached on 7:30am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Bc  
4/20/07

A handwritten signature in black ink, appearing to read 'B. Chen', with a stylized flourish at the end.

**BRET CHEN**  
**PRIMARY EXAMINER**